INCREASING PEDIATRIC INFLUENZA VACCINATION RATES IN A COMMUNITY HEALTH CLINIC

A DOCTOR OF NURSING PRACTICE PROJECT SUBMITTED TO THE OFFICE OF GRADUATE EDUCATION OF THE UNIVERSITY OF HAWAIʻI AT MANOĀ IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF NURSING PRACTICE

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Abstract

Influenza is a contagious respiratory illness leading to numerous hospitalizations and deaths annually. Among the pediatric population, children under the age of five years have the most significant impact from influenza, showing greater rates of morbidity and mortality than any other age group. Despite the burden, influenza vaccination rates remain low. The purpose of this quality improvement (QI) project was to implement an educational program targeting parents and providers addressing common barriers at Wahiawa Community Health. Through these interventions, the goal of this project was to increase influenza vaccination rates among children between the ages of six months to four years using educational pamphlets and visual/auditory teaching tools. Educational interventions addressed provider and patient barriers that increased knowledge about the burden of pediatric influenza, local and national statistics, and safety and efficacy of influenza vaccinations, which was presented among the entire staff. As a result, Wahiawa Community Health increased their influenza vaccination rates to 60.59% during the 2018-19 year, which was a substantial increase from 16.17% during the 2017-18 year.

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Description of Problem

Influenza is a contagious respiratory illness with symptoms that include fever, chills, cough, body aches, and fatigue (Baskin, 2018). On average, these symptoms can persist up to two weeks but may also result in further complications that could potentially lead to hospitalizations or even death (Baskin, 2018). Influenza significantly impacts the United States each year. An estimated 30.9 million people were diagnosed with influenza during 2016-17 in the United States (Centers for Disease Control and Prevention [CDC], 2018). Within the general population at risk for influenza, children are particularly susceptible to contracting this contagious respiratory illness due to their developing immune systems (CDC, 2018). Among the pediatric population, children under the age of five years have the most significant impact from influenza, showing greater rates of hospitalization and complications than their older counterparts (Ruf & Knuf, 2012). Within this age group, influenza-related hospitalizations have ranged from 7,000 to 26,000 each year and up to 174 deaths annually since 2010 (CDC, 2018). During the most recent 2017-18 influenza season, 174 children died between the months of October and May from influenza, making it one of the deadliest seasons (CDC, 2018). Additionally, children with asthma, heart disease, neurodevelopmental disorders, or children born prematurely have compromised immune systems leading to increased vulnerability to influenza and its associated complications (CDC, 2018). These complications include acute respiratory distress syndrome, secondary bacterial infections, sepsis, and pneumonia which is the most frequently reported complication among children who died (Usonis, Anca, & Francis, 2010).

Due to the burden of influenza, the most effective way to reduce disease rates and complications is through vaccination. The influenza vaccine is recommended to everyone over

the age of six months and is the best option for protection during the influenza season, significantly reducing a child's risk of severe influenza and death (AAP Committee on Infectious Diseases, 2017). This recommendation is especially important in reducing exposure, as it is common to see from the culture in Hawaii that grandparents are often caregivers to children due to dual income families and high costs of child care. Despite the recommendation and known efficacy of the vaccine, 40.7% of children do not get vaccinated, resulting in increased morbidity and mortality (CDC, 2017). For example, during the 2016-17 influenza season more than 100 children in the United States died from influenza, and thousands were hospitalized for severe illness or complications from the virus. Of those 100 children that died in 2016-17 more than 80% of them were not vaccinated (AAP Committee on Infectious Diseases, 2017).

As a result of the significant burden of influenza and the association with poor pediatric influenza vaccine uptake, efforts will be made to increase the vaccination rates by addressing the current barriers leading to poor influenza vaccination outcomes in the pediatric population. The common themes identified in the literature related to influenza immunization barriers include health system barriers as well as a lack of education for both the parents of children and the pediatric providers.

This project was focused at Wahiawa Community Health, a rural health center targeting underserved populations located in Oahu, Hawaii. Background data was gathered by accessing Wahiawa records for the Vaccines for Children (VFC) program, a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated. The VFC program is eligible for both children who have Medicaid insurance, which is determined based on family income, as well as for those children with no insurance.

In the year 2017-18, Wahiawa Community Health was noted to have a total pediatric population 1,242 from the age birth to 18 years of age. Of these patients, 851 (68.5%) were enrolled into the Medicaid health insurance program. From this group of pediatric patients, the records from 2017-18 showed there was a total of 303 children between the ages of six months to four years with Medicaid insurance. This target population between six months and four years was selected for the project due to their increased risk for morbidity and mortality related to the influenza virus (CDC, 2017). Amongst the 303 children, ages six months to four years with Medicaid insurance, only 49 children (16.17%) were vaccinated for the influenza in 2017-18. This vaccination compliance rate falls short compared to the national average of 70% among all children regardless of insurance type between six months to four years of age (CDC, 2017). Among children specifically with Medicaid insurance, nationally 18.8% were vaccinated against influenza (Yoo, 2011). The purpose of this project was focused on improving influenza vaccination rates amongst children with Medicaid insurance between the ages of six months to four years of age.

Literature Review

The purpose of the literature synthesis was to gather relevant and pertinent data regarding the identified topic. The database searches included PubMed, CINAHL, and Google Scholar, with articles limited between the years 2005-2018. Key terms used in the search included “pediatric influenza vaccine”, “pediatric influenza vaccine rate”, “pediatric influenza burden”, “pediatric vaccination”, “pediatric vaccination barriers”, “barriers to influenza vaccines in children”, “vaccination compliance”, “improve vaccination rates”, “(strategies or interventions or methods) and (improve pediatric vaccinations)”, “interventions improving vaccination rates”, and “influenza and Medicaid”. Using these search terms, filters were applied to compile articles

within the targeted age group of six months to four years. Additionally, these articles were further limited to studies in the United States. The grading tool used was Mosby's level of evidence, using non-experimental studies (level IV), systematic reviews (level V), descriptive/qualitative studies (level VI), and expert committee reports (level VII) with a total of 35 articles critiqued (Ackley, 2008).

Influenza in Pediatrics

The 2017-18 influenza season was the deadliest season yet, with 174 pediatric deaths (CDC, 2018). This number exceeds the 2012-13 season which previously set the record for the highest number of influenza-related deaths in children reported during a single influenza season (CDC, 2018). Within the past 10 influenza seasons, the rates of hospitalizations for children younger than five years have always exceeded the rates for children aged 5-17 years (AAP Committee on Infectious Diseases, 2017). Although children with certain health conditions are at higher risk of complications, 59.7% of influenza-related deaths occurred in children with no high-risk underlying medical conditions (AAP Committee on Infectious Diseases, 2017). Given the unpredictable nature of influenza and the associated complications, the influenza vaccine continues to remain the best available preventative measure against influenza.

Influenza Vaccinations

Approximately 85% of pediatric influenza-related deaths have occurred in unvaccinated children aged six months and older (AAP Committee on Infectious Diseases, 2017). Individuals six months and older are recommended for the influenza vaccine and has been documented in the literature as the best option for protection during the influenza season (AAP Committee on Infectious Diseases, 2017). Inactivated influenza vaccines (IIV) have been determined to safe when administered to children and adults, with common reactions reported as pain, redness, or

swelling at the injection site (CDC, 2017). However, each year vaccine strains are predicted to match circulating influenza strains that research findings indicate will be most common during the upcoming season. For children under the age of five years, the vaccine efficacy against influenza is broad, ranging from 12-83% (Usonis, et al., 2010). The efficacy and effectiveness is largely dependent on age, immune response of the recipient, and the similarity between the vaccine and influenza viruses in circulation (Usonis, et al., 2010). While influenza vaccines can vary in efficacy each season, a CDC study revealed that in 2017, the influenza vaccine proved to be life-saving for many children (Shang, Blanton, & Brammer, 2018). This study examined data collected from four influenza seasons, between years 2010-2014 and discovered that influenza immunizations reduced the risk of influenza-associated deaths by 65% among healthy children. Despite the variation in vaccine efficacy, influenza vaccination is the best form of prevention and defense against influenza for reducing incidences of influenza.

Influenza Immunization Barriers

While the literature supports the efficacy of the influenza vaccine and recommends this preventive service for individuals over the age of six months by the AAP, there are still less than optimal immunization rates of the influenza vaccine with a coverage of only 18.8% in children with Medicaid insurance (CDC, 2017; Yoo, 2011). Current barriers to influenza vaccine immunizations documented in the literature leading to poor pediatric vaccination rates include health system barriers, provider barriers, and parental barriers (Esposito, 2014).

There are multiple health system barriers that currently exist including cost, reduced vaccine supply and distribution, lack of a system to collect and consolidate vaccination status of patients, and missed opportunities (Esposito, 2014). Delays in VFC influenza vaccine shipments can be a major contributor to vaccination delays and missed opportunities (Bhatt, Block, Toback,

& Ambrose, 2011). Providers have reported that the initial shipments of VFC influenza vaccines generally arrive four to five weeks later than non-VFC shipments (Bhatt, et al., 2011). Therefore, pediatric influenza vaccination administration is delayed starting in early November during the influenza season, especially impacting children in need of two-dose vaccines (Bhatt, et al., 2011; Esposito, 2014). The delay in VFC influenza vaccine supply is also a major health system barrier, resulting in decreases of pediatric influenza vaccination rates by approximately 19% compared to non-VFC vaccines (Bhatt, et al., 2011). According to Allen (2017) among Medicaid patients, these identified health system barriers had the greatest effect on healthcare utilization.

Provider barriers can also play a role in immunization rates of children. Provider's lack of knowledge of immunization indications and contraindications, poor access to children's immunization records, missed visits/missed opportunities, and poor communication with parents have been recognized as barriers contributing to low immunization rates (Allen, 2017; Esposito, 2014). Parents consider healthcare staff to be the most important source of information when deciding whether their child should be vaccinated (Nowalk, 2014), with physician recommendation noted to be one of the strongest predictors of influenza vaccination among pediatrics and also the main reason leading to vaccination compliance (Esposito, 2014; Nowalk, 2014). According to the CDC (2017), due to the reported lack of recommendation and education from physicians, approximately 40.7% of children do not get immunized against influenza.

Several immunization barriers exist related to children's parents or guardians including a poor understanding of the value of vaccines, fear of adverse effects, problems in understanding the complex vaccination schedule, logistic problems to access care, and economic problems (Esposito, 2014). In order to better understand parental barriers, Schmid, Rauber, Betsch, Lidolt and Denker (2017) investigated these barriers and their results indicated that vaccination

hesitancy caused decreases in influenza vaccination uptake. Additionally, in a low-income community, 46% did not immunize due to vaccination hesitancy and misperceptions of the influenza vaccine with reasons being 1) vaccine leads to illness, 2) the vaccine is unnecessary, or 3) the vaccine is ineffective (Suryadevara, Bonville, Rosenbaum, & Domachowske, 2014). In 2010, Flood noted parents did not opt for the influenza vaccine for their children due to the perceived low risk of influenza and its complications. This lack of education and uncertainty is a significant parental barrier contributing to decreased influenza vaccination rates.

Strategies to Increase Influenza Immunization Rates

The significance of missed vaccination opportunities has been documented in diverse practice settings and aims to increase influenza vaccination coverage has been recognized (Stinchfield, 2008). Having identified health system, provider, and patient barriers to influenza immunizations, several successful strategies including those related to health systems, providers and parents have been implemented in order to increase influenza vaccine rates among pediatric patients. Strategies targeting health system barriers include reducing incidences of vaccine supply, improving vaccination collection and consolidation status systems, and decreasing missed opportunities. Among provider strategies, efforts to improve pediatric influenza vaccination rates have included education about the burden of influenza, improvements in provider-to-parent communication, in addition to emphasizing the importance of reducing missed opportunities. Due to the lack of education as a significant parental barrier, methods of education addressing parental perceptions of influenza susceptibility and severity, vaccine hesitancy, and the efficacy of the influenza vaccine have been used to improve vaccination rates.

Health system interventions.

Health system barriers have been seen to have a significant impact on missed opportunities and healthcare utilization among patients (Allen, 2017). According to Esposito (2014), the administration of vaccines may be delayed during periods of shortages, however, appropriate reminder/recall systems should be enforced to ensure the correct number of vaccine doses are received when the vaccine is once available. It has been shown that the used of population-based systems that collect and consolidate vaccine data has improved vaccination coverages (Esposito, 2014). To decrease the number of missed opportunities and increase influenza vaccination coverage among pediatrics, Stinchfield (2008) used an intervention where children eligible for the influenza vaccine in the electronic medical record (EMR) were identified. The generated list was used for parent call reminders and influenza vaccine recommendations mailed to patient parents leading to an increase of immunization rates by 17% (Stinchfield, 2008). Utilization of the Four Pillars Toolkit which targets 1) convenient vaccination services, 2) notifications to parents, 3) enhanced office systems to facilitate immunizations, and 4) vaccination promotion/recommendation by healthcare staff has been used with success, resulting in an increase to 77% for influenza vaccination rates from a previous rate of 46% (Nowalk, 2014).

Provider interventions.

Among provider interventions, strategies have been used to provide the necessary education about the burden of influenza, to improve provider-to-parent communication, in addition to decreasing missed opportunities. One strategy successful in increasing immunization rates utilized education in addition to developing a specific policy with vaccine recommendations for providers and healthcare staff at their federally qualified community health

centers and Women and Infant Care (WIC) clinics. By educating providers and staff, utilizing recent data on the burden of influenza published by the CDC on pediatric influenza, and implementing specific clinic policies for influenza vaccinations there was a documented increase of influenza vaccinations in pediatrics from 12% to 32% and was achieved within the first year after the interventions with the providers (O'Connor, 2012). Provider-to-parent miscommunications have also been determined as a contributor to lower influenza rates (Murphy, 2014). To offset these provider barriers, education emphasizing vaccine effectiveness and decision support interventions have been successful used in low-income communities resulting in increased vaccination rates as well as a reduction in provider-to-parent miscommunication. Standing orders have been also implemented in some clinics for individuals meeting the criteria to be vaccinated resulting in increased immunization and reduction in missed opportunities. (Vlahov, Coady, Ompad, & Galea, 2007). This strategy was proven to be particularly beneficial in hard to reach populations (Vlahov, et al., 2007). Through these methods addressing provider barriers, outcomes have led to an increase in influenza vaccination rates and bridging the gap between miscommunications in the healthcare setting.

Patient interventions.

Parental education is a successful intervention, which has led to improved knowledge of influenza and increased pediatric influenza vaccination rates (Murphy, 2014). Education addressing parental perceptions of influenza susceptibility and severity, vaccine hesitancy, and the efficacy of the influenza vaccine has been shown to improve influenza vaccine coverage (Ewig, 2018). In 2016, Zimmerman aimed to reduce barriers through education sessions allowing for better communication at each patient provider interaction. These education sessions used visual educational teaching tools to address parents' understanding of influenza, the

rationale for influenza vaccine, and promoted the vaccine among their children resulting in an increased pediatric influenza vaccination compliance from 5% to 37% (Zimmerman, 2016). As evidenced by the literature, addressing parental barriers and concerns through appropriate interventions can significantly increase the uptake of childhood influenza immunizations.

Framework

The Iowa Model of Evidence-Based Practice was developed by Marita Titler, PhD, RN, FAAN to describe knowledge transformation and to aid with the implementation of research into clinical practice (Titler, 2001). The Iowa Model focuses on organization and collaboration incorporating conduct and use of research, along with other types of evidence. This model allows us to focus on knowledge and problem-focused triggers, leading staff to question current nursing practices and whether care can be improved through the use of current research findings (Titler, 2001). The seven steps of the Iowa model include:

1. Selection of topic
2. Forming a team
3. Evidence retrieval
4. Grading the evidence
5. Developing an evidence-based practice standard
6. Implementing evidence-based practice
7. Evaluation

Using research to guide practice decisions, this model focuses on the entire healthcare system from the provider, patient, and infrastructure.

Evidence-based practice has been gaining popularity in healthcare settings due to the increasing need to improve patient outcomes, actions and interactions with patients, and to

deliver the best quality care. For the purpose of this project, evidence was gathered in order to improve influenza vaccinations rates among the pediatric population at Wahiawa Community Health.

PICO Question

Patient/Population/Problem: Clinical staff and parents of children 6 months to 4 years with Medicaid within a community health clinic with low influenza immunization rates.

Intervention: Education program for healthcare staff and parents of young children with Medicaid and ages six months to four years.

Comparison: Standard practice

Outcome: Improve incidence of influenza vaccinations amongst Medicaid patients from the ages of six months to four years of age.

PICO Question: Will the implementation of an educational intervention targeting clinical staff and parents increase pediatric influenza vaccination rates among Medicaid patients from the age of six months to four years?

Purpose/Goals/Aims

The purpose of this evidence-based practice project was to implement an educational program directed toward providers and their patient population in a pediatric practice in an effort to improve pediatric influenza vaccination rates at Wahiawa Community Health. Of the pediatric patient population, the aim was to increase influenza vaccination rates among Medicaid patients between the ages of six months to four years. This project utilized visual educational teaching tools targeting parents and providers over the course of four months (September 2018 to February 2019). The educational content addressed the burden of influenza in pediatrics and describe the safety and efficacy of influenza vaccinations. A logic model is provided to

demonstrate the project goals and outcomes from the interventions (see Appendix A). The overall goal of this project was to increase influenza vaccination rates among children by educating parents and providers at a community health center.

Methods/Procedures

Project Design

This project used several of the strategies mentioned in the literature to guide the implementation of an educational program for parents and providers at a community health center. The education and plan was guided by the vaccine recommendations and guidelines of the ACIP, suggesting routine annual influenza vaccination to be given to all individuals ages six months and older who do not have contraindications. Following the Iowa Model, its focus uses evidence to guide practice decisions with aims to improve the entire healthcare system from patients to providers (Titler, 2001). This integration of research and clinical practice is best suited for this project with the focus being an improvement in patient outcomes at Wahiawa Community Health.

As evidenced by the research education targeting parents and providers have shown to improve pediatric influenza vaccination rates (ACIP, 2008; Ewig, 2018; Murphy, 2014; O'Connor, 2012; & Zimmerman, 2016). For the purpose of this project, barriers were addressed by discussing with the providers the burden of influenza in pediatrics and providing education on influenza vaccinations. A 30-minute educational in-service using a PowerPoint presentation was held during the lunch hour in September 2018 for healthcare staff and providers. This educational strategy targeted two pediatric providers and six medical assistants. This educational session included 1) up to date information on the burden of influenza, 2) local and national

statistics, 3) safety and efficacy of influenza vaccinations (see Appendix C), and 4) the review of parent education materials provided to all parents of pediatric patients (see Appendix D).

Following the in-service educational sessions, parental handouts were provided to healthcare staff members. These handouts were given to all parents at every patient encounter from the months of September 2018 to February 2019. The content on these materials were simplified and culturally sensitive, containing information regarding 1) the burden of pediatric influenza, 2) local and national statistics, and 3) safety and efficacy of influenza vaccinations (see Appendix D).

Using evidence-based practice, these interventions were used with the intention to improve parental and provider knowledge. Multiple forms of educational material have been produced to address the various levels of reader comprehension. Using this project design and these evidence-based practice strategies, efforts were made to improve pediatric influenza vaccination rates during the 2018-19 influenza season. Education was provided to all pediatric patients and parents, although the target population for this project were children from the ages of six months to four years.

Human Subjects Consideration

The design of this evidence-based practice project is a considered a quality improvement project. A quality improvement project is defined as a systematic, formal approach to the analysis of a practice and efforts to improve performance (AAP Committee on Infectious Diseases, 2017). The performance under review for this project will be pediatric influenza vaccination rates after the implementation of provider and parental education.

With the design of this practice change being a quality improvement project, an IRB was not needed to be obtained. Due to the low rates of influenza vaccination (16.17%) among

children at Wahiawa Community Health, educational interventions have been implemented to increase immunization rates and decrease the burden of influenza. To protect patients' rights, personal data were not revealed and demographics were submitted anonymously.

Sampling Plan

During the 2017-18 influenza season the sample size of pediatric patients with Medicaid insurance and age six months to four years was approximately 303. It is anticipated that the total enrolled will be similar in the 2018-19 season. Educational handouts were provided to all parents of children meeting the inclusion criteria for this project. The inclusion criteria included children between the ages of six months to four years and currently enrolled in the Medicaid program or are uninsured, which allows for free immunizations through the VFC program. Exclusion criteria are children younger than six months, older than five years of age, or individuals with commercial insurance.

Data Collection Procedures

Preliminary data collection during the 2017-18 influenza season indicated there were 303 patients between the ages of six months to four years with Medicaid insurance and therefore eligible to receive influenza vaccination through the VFC program. However, out of the 303 children only 49 received the influenza vaccine. During the implementation phase from September 2018 to February 2019, monthly reports were generated to collect data of total pediatric encounters, number of Medicaid participants, and number of VFC influenza vaccines administered to the targeted age population. Final data was collected in the month of February 2019 to measure the interventional impact during the 2018-19 influenza season. A timeline of the project implementation phase is provided (see Appendix B).

Results

The educational intervention was held during mid-September 2018 with a total of 32 participants including one Medical Doctor (MD), five nurse practitioners (NP), the clinic administrator, Chief of Operations (COO), clinic manager, six medical assistants, and 17 office staff members. The educational intervention included a PowerPoint presentation held at the clinic which targeted all staff members. Further training occurred the following week for the front staff and medical assistants in which the custom-made educational teaching materials were provided at patient check-in, triage, and patient check-out. These interventions were well received by the participants who showed great interests in the data since the influenza season was approaching. Data collection occurred between the months of September 2018 through February 2019, with 622 Medicaid pediatric patients encounters at Wahiawa Community Health. Of the 622 patients, 236 children were in the specified age group between six months to four years compared to 303 encountered during the 2017-18 influenza season. Of the 236 children, 143 received the influenza vaccine totaling to 60.59% vaccination compliance, which was a substantial increase from 16.17% during the 2017-18 year.

Vaccination rates varied throughout the months of September 2018 through February 2019. During the month of September 2018, the influenza vaccination rate totaled 13.15% in the specified age population. Subsequently, following the educational intervention addressing provider and patient barriers, influenza vaccination rates increased to 78.48% in October 2018, surpassing the national average of 70% among children six months to four years of age during the 2017-18 season (CDC, 2017). These values were calculated using the number of encounters and the number of vaccines given within the age group.

The influenza vaccination rates continued to remain above the national average in November 2018 with a vaccination rate of 71.74%, although a decrease was seen in December 2018 and January 2019, with values of 67.57% and 50% respectively. The highest vaccination rate seen was in October 2018, one month after the intervention implementation at 78.48% and the lowest rate of these months in January 2019 at 50%. Despite these decreases, the average influenza vaccination rate was 60.59%, which shows significant improvement compared to the previous influenza season in 2017-18 at 16.17%.

Discussion

Prior to the educational intervention, influenza vaccination rates remained low at 16.17% during the 2017-18 influenza season. The educational intervention addressed provider and patient barriers that increased knowledge about the burden of pediatric influenza, local and national statistics, and safety and efficacy of influenza vaccinations, which was presented among the entire staff at Wahiawa Community Health. From this, an immediate increase of influenza vaccination rates was seen in the following month during October 2018 at 78.48%, a substantial increase from the previous year's influenza vaccination rate of 16.17%.

Education intervention and methods to achieve optimal immunization rates was based on the belief that education should be provided to all staff and not only the providers. This method of implementation created a foundation of education for all staff, and was further reinforced among the office staff and medical assistants at check-in, triage, and check-out which is a major point of patient/parent contact. This intervention successfully increased influenza vaccination rates during the 2018-19 season. However, during the course influenza season, these rates began to decrease, more notably during December 2018 and January 2019 which may have been related to changes in staffing and additional education interventions not provided. While decreases in

influenza vaccination rates were seen during this time period, the total vaccination rate remained high at 60.59% which was a significant improvement compared to the 2017-18 influenza season.

These findings support the literature documenting the benefits of addressing patient and provider barriers in the clinic setting (Ewig, 2018; Murphy, 2014; O'Connor, 2012; Zimmerman, 2016). Traditionally, low income populations are difficult to reach for health services involving preventative care and immunizations (Allen, 2017). However, addressing patient and provider barriers significantly increased influenza immunization rates, which is particularly encouraging given the high risk of complications seen in the pediatric population.

Limitations

The estimates in this study are subject to the following limitations. First, the findings were limited to Medicaid patients participating in the VFC Program, which accounts for 68.5% of the total pediatric patient population at Wahiawa Community Health. The study design could be improved by including all patients without consideration to insurance. Furthermore, another limitation includes not knowing if at the encounter date the child was eligible for the influenza vaccine (i.e., received from previous encounters or experiencing any current illnesses). Lastly, other limitations in the study include changes in clinic staff after the implementation of the intervention. Additional education was not provided to new staff members, and was also not offered again after the start of the influenza season which may lead to sustained vaccination rate increases during the latter months of influenza season.

Conclusion

The influenza vaccine continues to be the best available preventative measure against influenza given its unpredictable nature and associated complications – especially among children under the age of five whose rates of hospitalizations have exceeded the rates of children

aged 5-17 (AAP Committee on Infectious Diseases, 2017). The influenza vaccine has been shown to reduce the risk of influenza-associated deaths by 65% among healthy children (Shang, Blanton, & Brammer, 2018). Education has been seen to be a successful intervention, leading to improved knowledge of influenza and increased pediatric influenza vaccination rates (Murphy, 2014). This intervention has been shown to improve influenza vaccine coverage, particularly when used to address parental perceptions of influenza susceptibility and severity, vaccine hesitancy, and the efficacy of the influenza vaccine (Ewig, 2018).

This project provided educational sessions that addresses common barriers in influenza vaccination compliance. These educational interventions were presented to all providers and clinic staff using a visual PowerPoint presentation. As a result, Wahiawa Community Health achieved increased influenza immunizations within the first month of implementation, and has seen an increase of pediatric influenza vaccination rates from 16.17% during the 2017-18 influenza season to 60.59% during the 2018-19 season. This intervention was created to be simple and delivered with ease, resulting in positive outcomes that led to improved influenza vaccination rates within the first month of implementation. This not only benefits the children and families by reducing illness and health care costs associated with loss work days and hospitalizations, but also increases provider compliance with national standards.

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Appendix A

Logic Model

Inputs	Outputs: Activities	Outputs: Participants	Short Outcomes (Learning)	Medium Outcomes (Actions)	Long Outcomes (Conditions)
• Time (program delivery Sep 2018 – Feb 2019) • Time and content expertise: pediatrician – Dr. Pascua, project chair – Dr. Mattheus • Equipment (computers, projectors) • Stakeholders (Wahiawa Community Health)	• Educational in-service for healthcare staff and providers in Sep 2018 • Educational handouts given to parents Sep 2018 – Feb 2019 • EMR data extraction using Athena data reports	• Two pediatric providers • Six medical assistants • Four front staff personnel	• Healthcare staff and providers' increased knowledge of influenza burden • Parents increased knowledge of influenza and vaccines	• Increased pediatric influenza vaccination rates 2018-19 season • Decreased burden of influenza in 2018-19 season	• Increased knowledge of influenza and vaccine in the community • Decreased burden of pediatric influenza upcoming seasons • Increase pediatric influenza vaccination rates each season

Appendix B

Gannt Chart

Objectives		2018			2018			2019	
A	**Education**	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	Education Provided to Healthcare Staff/Providers Sep 2018								
2	Education Provided to all Pediatric Parents Sep 2018 - Feb 2019								
B	**Data Collection**								
1	Gather Preliminary Data July 2018								
	Extract EMR Reports Oct 2018 - Feb 2019								
2	VFC Data Collection Oct 2018 - Feb 2019								

Completed

Projected

Appendix C

Provider Education Intervention

INCREASING PEDIATRIC INFLUENZA VACCINATION RATES

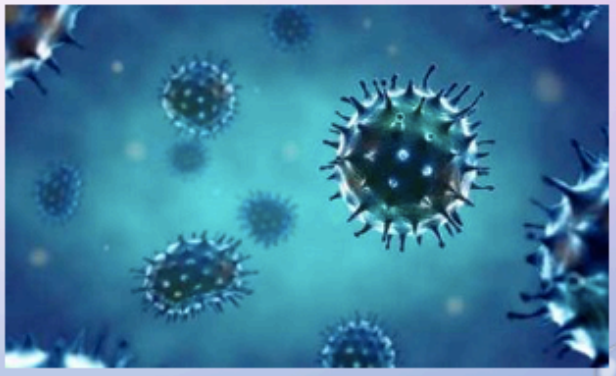
BY: NANCY BANH
UNIVERSITY OF HAWAII AT MANOA
DNP STUDENT

WHAT IS INFLUENZA?

- Commonly known as "the flu"
- Highly contagious
- Cases seen from the months as early as October or as late as May
- Influenza virus A & B responsible for seasonal epidemics
- Influenza virus C responsible for mild respiratory illnesses

VIRUS STRAINS

- Influenza viruses are continuously changing
- New strains not recognized by the immune system
- Influenza vaccines are developed to match circulating influenza strains



SYMPTOMS

- Fever, chills, cough, body aches, and fatigue
- May lead to secondary complications: pneumonia, acute respiratory distress syndrome, secondary bacterial infections, or sepsis

BURDEN OF INFLUENZA

- Approximately 30.9 million people were sick from influenza during the 2016-17 season (CDC, 2018)
- Influenza-related hospitalizations have ranged from 7,000 to 26,000 each year in the United States (CDC, 2018)
- 174 children died during the 2017-18 season – deadliest influenza season
- More than 80% of children who died did not receive the influenza vaccine
- Children under the age of five years have greater rates of hospitalizations and complications

STATISTICS

- Nationally, 40.7% of children do not get the influenza vaccine
- Between the ages of 6 months to 4 years: 70% influenza vaccination rate in the United States
- Between the ages of 6 months to 4 years at Wahiawa Community Health: 16.17% influenza vaccination rates in VFC program

INFLUENZA VACCINE

- Best form of prevention
- Recommended to individuals ages 6 months and older
- Safe to administer
  - Common reactions: pain, redness, or swelling at injection site
- Efficacy ranges from 12-84% depending on virus strain match
- Despite efficacy ranges, influenza-associated deaths reduced by 65% among health children from influenza vaccine in 2010-2014

VACCINATION RECOMMENDATION

- Your recommendation is a critical factor that affects whether or not your patients receive the influenza vaccine
- Research shows effectiveness of provider vaccine recommendations
- Use the "SHARE" method

"SHARE" METHOD

- S – SHARE The reasons why the vaccine is right for the patient
- H – HIGHLIGHT Positive experiences with influenza vaccines
- A – ADDRESS Patient questions or concerns about the influenza vaccine
- R – REMIND Patients that influenza vaccines protect them and their loved ones
- E – EXPLAIN Potential costs of influenza and serious complications

ADDITIONAL RESOURCES

- Centers for Disease Control and Prevention
  - www.cdc.gov/flu
- World Health Organization
- State of Hawaii, Department of Health
  - Disease Outbreak Control Division
  - Phone: 808.587.6845

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Appendix D

Patient Education Intervention

What is the Flu?

Contagious respiratory illness with symptoms that include fever, chills, cough, and body aches. These symptoms can last up to 2 weeks!

How Serious is the Flu?

An estimated 30.9 million people were sick with the flu from 2016-17.

Children under the age of 5 years have the greatest rates of hospitalizations and complications.

How Can I Protect my Child from the Flu?

The flu shot is the best form of protection.

Flu vaccination is recommended for everyone 6 months and older.

What Should I Know About the Flu Vaccine?

A flu vaccine cannot cause flu illness.

Millions of people have safely received the flu vaccines for decades.

Common side effects are soreness where the shot is given, muscle aches, and fever.

It may decrease risk of getting sick.

The flu shot may make your symptoms milder.

What if my Child Gets Sick?

Make sure your child hydrates and gets plenty of rest.

If your child is 5 years or older, continue to monitor if symptoms worsen.

If your child is younger than 5 years, your child is at high risk for serious complications. Call your doctor right away if they develop flu symptoms.

You can protect your children from getting the flu with the vaccine!

For additional help, contact:

Wahiawa Community Health

Phone: 808.622.1618

Email: info@wahiawahealth.org

Images retrieved from:

http://voiceofthevalley.com/2017/01/18/ways-help-not-speading-flu/flu/

https://www.contagionlive.com/news/researchers-discover-new-virus-called-influenza-d

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